

# BEST PRACTICES FOR WATER QUALITY TRADING

## JOINT REGIONAL AGREEMENT

### Discussion Guide, June 5-6<sup>th</sup>, 2013

This Discussion Guide is intended to provide definitions, context, analysis, and options for addressing various components of water quality trading programs. It poses questions that will be discussed at the interagency workshops. This document may reference other trading programs, examples, or documents, but is not intended to serve as a published report or white paper and thus will not be extensively cited. This document will be included in the workshop packet and posted online following each workshop.

## 2. Overall Trading Program Requirements Ratios, Reserves, and Baselines

This section describes some of the most fundamental design components for a trading program. From trading ratios to reserves, and from baseline to other additionality requirements, these elements provide a foundational part of a solid trading program. Considerations and options are presented for the following components, numbered corresponding to the organization of the Tier 2 draft outline:

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### 2.1 Trading ratios

Trading ratios are discount factors, generally applied to the total potential pollution reduction from a nonpoint source project to account for various factors. Trading ratios can help account for watershed processes, risk, and uncertainty. These factors often include uncertainty—both in terms of measurement error and project performance, attenuation of pollution from the nonpoint source to some downstream point of compliance (esp. for nutrients), ensuring environmental benefit, or ensuring equivalency across types of pollutants. This portion of the options memo draws heavily from U.S. EPA's Permit Writer's Toolkit (pp. 30-33) and includes excerpts from Willamette Partnership's *In It Together* (Vol 2, pp. 35):

Delivery or location ratios: Account for the change in pollutant quantity and form as it moves from a point upstream to a further point of concern downstream as identified in a TMDL or other watershed plan. Delivery ratios can also account for movement of pollutants from the edge of a field into the stream. Delivery ratios are sometimes included in models (e.g. the Chesapeake Bay Watershed Model), and are reflected in credit calculations themselves (e.g. Nutrient Net as applied in the Chesapeake). Delivery ratios usually incentivize action closer to the point of discharge. This may not always

be appropriate. For example, Idaho's Lower Boise River program wanted to incentivize nutrient reductions near the confluence of the Boise and Snake Rivers where irrigation canals rejoined the river. Reductions at that location were needed most to reduce nutrient loading further down in the Snake River. The point source buyers were all further upstream on the Boise River. The trading program ended up using delivery ratios mouth of the river where they were needed most, while but?using delivery ratios in the Lower Boise that gave more credit for reductions further away from upstream buyers.

**Equivalency ratios:** These ratios adjust for trading in different forms of the same pollutant. For example, a point source may discharge nutrients in a form that is biologically available—algae can use it quickly to bloom, but nonpoint sources may reduce less biologically available forms of nutrients. Equivalency ratios can also account for cross-pollutant trades. For example, reducing a pound of phosphorus on farms might have the same water quality effect as reducing equal equal ten pounds of nitrogen discharged from a wastewater facility.

**Uncertainty or Reserve ratios:** There are a lot of unknowns in trading. Uncertainty ratios can help account for measurement uncertainty and implementation uncertainty as better science becomes available. Measurement uncertainty accounts for errors in credit calculation methods. Implementation uncertainty accounts for potential project failure, both from best management practices (BMPs) not performing as anticipated and from unanticipated events such as a flood knocking out filter strips. A portion of credits can be held in "reserve" to account for these failures. The Ohio River program requires that all projects reserve 10% of all credits sold to account for uncertainty and project failures. Sometimes, different BMPs may have different uncertainty ratios.

**Retirement ratios:** Retirement ratios. This ratio term has been used in different ways, therefore having at least two distinct meanings. If both are used, they will be need to be calculated separately and then recombined, if desired. One use of a Retirement ratio s can help trading trading trading is to create a net water quality benefit. For example, they it can ensure that for every pound of sediment discharged into a stream, at least 2-4 pounds of sediment are removed. Retirement ratios can also be used to incentivize projects that deliver environmental benefits beyond water quality (e.g. a lower ratio for BMPs that provide habitat benefits in addition to nitrogen reductions). Another use of a retirement ratio is to deduct a portion of the credit amount to represent a landowner's share of the reduction needed to achieve the Load Allocation. This relates to the discussion in section 4 titled "Timing of meeting baselines" and, in particular, option B.

The different factors above can be merged together in a single ratio or kept separate. Keeping ratios separate may allow programs to better optimize project location and design to reduce risk, and more easily fold in new information on actual risk. As a final caution, trading ratios can be a significant factor in credit cost and should be developed carefully.

Ratios should be based in science. If watershed goals, economic feasibility, and appropriate levels of risk need to be considered, they are included in trading ratio decisions carefully and thoughtfully. Setting ratios too high reduces potential cost savings for point sources, but setting them too low places undue risk on the environment.

## I. Options and examples

What documentation does there need to be to justify trading ratios?

Mathematically, trading ratios have an enormous impact on the quantity of credits available for sale, yet for trading programs around the country, there is often little documentation about how they are developed. How can trading programs better document the selection of a trading ratio, and where

should that documentation lie? Should it be in the total maximum daily load (TMDL), trading plan attached to a permit, statewide policy, or multiple places?

What is the right scale at which to set trading ratios?

Some programs set trading ratios programmatically (e.g. a 2:1 ratio or a 3:1 ratio) or even at a statewide level. Others, particularly those attenuating pollution, use a set of standard factors to determine a ratio for each transaction.

<p><b>Option A</b> <i>Use standard factors to determine a ratio for each transaction.</i></p> <p><b>Pros and Cons</b> The advantage of unique trading ratios based on a standard approach is the ability to address some of the unique risk and uncertainty factors for each trade without investing as much time and resources into every transaction. The biggest disadvantage is that this approach also creates <u>some additional</u> uncertainty for potential buyers and sellers of credits. Buyers may have a harder time predicting the amount and cost of potential supply. Credit suppliers will have a hard time figuring out the amount of credits they have until they identify a likely buyer.</p> <p>The Ohio Basin program has built software that allows both buyers and sellers to adjust quantities and prices based on unique trading ratios. The Klamath program did an analysis of research on attenuation between various zones of the watershed. These attenuation rates are proposed as the basis of trading ratios.</p>	<p><b>Option B</b> <i>Apply a single trading ratio across the watershed/trading area.</i></p> <p><b>Pros and Cons</b> This approach simplifies the application of trading ratios, and provides more predictability for buyers and sellers. A single trading ratio works well where pollution reductions anywhere in the watershed will have similar benefits to the overall water quality standards and other goals. However, this approach also reduces a program's ability to account for site-specific factors and variation in delivery/attenuation throughout the watershed.</p> <p><b>Option C</b> <i>In cases where information is not available to determine ratios under Option A or B, use a ratio of 2:1 or greater applied across the trading area until a more detailed ratio can be developed.</i></p> <p><b>Pros and Cons</b> This approach simplifies the application of trading ratios even more, but is not supported by the rationale provided in either Option A or Option B.</p>
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Does a ratio always need to account for delivery, equivalency, uncertainty, and retirement?

In some watersheds and for some pollutants, a state water quality agency and/or stakeholders may choose to adjust a ratio for several reasons. Delivery ratios may not be included if water quality improvements need to be focused in upper reaches to meet TMDL load allocations and water quality standards. Equivalency ratios may not be applicable in some trading scenarios. But should there always be some accounting for uncertainty and a net water quality benefit (one of the uses of the retirement ratio)? Applying ~~as another type of~~ retirement ratio might also be used to help ~~address baseline pollution reduction requirements for ensure nonpoint sources meet their load allocation requirements/pollution reduction requirements.~~

<p><b>Option A</b> <i>The documentation justifying a ratio should consider and record decisions for all four types of ratios.</i></p>	<p><b>Option B</b> <i>Only document ratios that were built into the final program design</i></p>
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**II. Recommended default:** Ratios should be based in science. If watershed goals, economic feasibility, and appropriate levels of risk need to be considered, they are included in trading ratio decisions carefully and thoughtfully, and documented in a transparent manner. Trading ratios can be applied as standard factors to individual transactions or combined together and applied as a single ratio for all transactions within a watershed. For either choice, decisions on ratios need to be documented to identify reasoning behind decisions for delivery/location, equivalency, uncertainty, and retirement ratios. Ratios should always be greater than 1:1 (e.g. for every unit of pollution discharged, there should be more than one unit reduced).

**III. Reasons to deviate from the default:** For more complex projects, state agencies may choose to adjust the trading ratio factors to account for increases in uncertainty, possibilities of significant environmental improvement, etc.

## 2.2 Reserve Pool

Several recent trading programs have established a reserve pool of credits to programmatically manage the risks stemming from uncertainty and project failure. In general, the reserve is built by applying a reserve/ retirement ratio to each credit project. A percentage of credits (via the ratio) from each transaction are then placed in a reserve managed by a trading program administrator. The reserve pool manager controls access to the reserve based on rules set forth in the trading program. Following are outstanding questions regarding reserve pools:

- Who manages the reserve pool (market administrator, state, point source entity)?
- Under what circumstances can a point source access credits from the reserve pool, when must they be purchased?
- How is the reserve repopulated over time?
- If the reserve gets too large, how are surplus credits dealt with?

The biggest advantage of a reserve is that it provides a mechanism for pooling and addressing risk of project performance across the entire program. Not all trading programs use a reserve, however. In some trading programs, NPDES permit holders are required to hold a minimum number of credits. If any of the projects associated with those credits fail, then they have a window of time to remedy that problem. As such, some NPDES permittees would rather “self-insure” by developing more projects than their requirements. [Other reasons to self-insure may include the inability of a permittee to purchase credits outside its jurisdiction or the permittee may be the only entity in the watershed with a trading program.](#)

### I. Options and examples

<p><b>Option A</b> <i>In permits, point sources are required to purchase credits and place them into a reserve pool.</i></p> <p><b>Pros and Cons</b> This option provides the greatest protection from programmatic risk of project failure. It builds a cushion of additional credits to help achieve water quality improvements and reduce the risk of non-</p>	<p><b>Option B</b> <i>Some publicly-funded projects are allowed to generate credits for the reserve.</i></p> <p><b>Pros and Cons</b> Some programs have discussed whether to allow Farm Bill-funded or other conservation projects to generate credits for the reserve. Hopefully these credits would never be used, but they might. The</p>
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compliance. There needs to be an entity managing the reserve, which means there will be some administrative costs. <del>Anti-backsliding issues may arise if the obligation to create a reserve pool is inserted into the permit as it relates to meeting effluent limits.</del>	advantage is the ability to apply stewardship and verification standards to these projects. The disadvantage is that some may perceive that conservation dollars are being used to offset impacts and that “double dipping” is occurring.
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#### Option C

*No mandatory reserve pool. Allow point sources to pay for/develop their own reserve pools as a voluntary risk mitigation measure.*

#### Pros and Cons

If a trading program or a specific NPDES permittee would like to have a reserve pool, they may use an additional ratio or keep an additional balance of credits voluntarily. This option provides flexibility, but is not likely to build a large reserve if permittees have a long window to remedy failed credit projects, and therefore little incentive to contribute to the reserve. Where projects take time to mature (e.g. riparian buffers for shade) remedying failed projects will not have the same environmental benefit as relying upon projects that are already in place through a reserve pool.

**II. Recommended default:** Option A — consider building a reserve/retirement ratio into the every trading programs where it makes sense. Trading programs may treat this ratio as a retirement ratio ~~(cancelling all credits discounted by the ratio)~~, or use it to populate a reserve account. If a reserve account is created, there need to be rules and oversight controlling use of that reserve account and who administers the account. Those rules need to include provisions for projects failing because it is the fault of the project developer and failure because of force majeure events, such as floods, fire, and drought. Reserve credits should only be accessed by projects within the same trading area.

**III. Reasons to deviate from the default:** There may be instances where states choose not to include a reserve/retirement ratio.

## 2.3 Regulatory baseline and 2.4. Additionality

All credit-producing activities must be “additional,” which means they are above and beyond what is otherwise required or would have happened without trading. ~~For water quality trading to be additional (and for the credits generated from a nonpoint source to be eligible), the nonpoint sources that provide credits must first meet any obligations they have to reduce pollution, also known as the “regulatory baseline.”~~ The 2003 EPA Trading Policy defines baseline as nonpoint sources first meeting their load allocations in a TMDL, or a minimum set of BMPs if there is not a TMDL. Setting these baselines is often one of the hardest parts of building a trading program because TMDL load allocations and minimum BMPs are often not defined in a clear, implementable way for individual nonpoint sources. ~~Providing guidelines on setting baselines and~~ is the focus of this section. Other eligibility requirements used to meet additionality standards for generating credits are discussed in the Discussion Guide for Section 4.

Regulatory baseline requirements are drawn from TMDLs, state and local laws, regulations, and policies, and TMDLs. The goal of this discussion is not to comment on TMDL development per se, but instead to inform how TMDLs can be better structured to inform trading programs. This memo

discusses several aspects of how to set and express regulatory baselines for trading, and how ~~baselines are~~ baseline related to achieving water quality goals, including:

- How are Load Allocations (LAs) modeled and completed?
- How do load allocations relate to baseline requirements for trading?
- How are a TMDL's reasonable assurances defined for meeting LA goals?
- How do existing state laws and policies shape baseline requirements beyond what is in a TMDL?
- How is a baseline requirement expressed in trading program? And at what scale?
- What is business as usual at individual project sites?

In an effort to help the agencies address these questions, Willamette Partnership (WP) and The Freshwater Trust (TFT) reviewed the following temperature, nutrient, and sediment TMDLs in Idaho, Oregon, and Washington:

- *Temperature*: Idaho (South Fork Clearwater); Oregon (Rogue Basin); Washington (Snoqualmie)
- *Nutrients*: Idaho (Mid Snake); Washington (Spokane); California (~~Upper Yakima~~ Klamath)
- *Sediment*: Idaho (Lower Boise); Oregon (Bear Creek); Washington (Upper Yakima)

This review highlighted the variation across states and watersheds in how TMDLs address baseline and LAs, as well as a few general trends regarding implementation plans and reasonable assurances. In each of the below sections, we have provided summaries specific to the pollutants studied as it relates to human use allowance allocation (where applicable), load allocations, reasonable assurances, and suggestions for tying all of these factors together.

### **2.3.1. Human Use Allowance (HUA), and TMDL Load Allocations (LAs)**

In each TMDL, regulators give allocations (or small amounts of allowable pollution) to sources of the target pollutant. Point sources are given Waste Load Allocations (WLAs) and nonpoint sources are given LAs. LAs define the pollution targets that nonpoint sources are supposed to meet and the 2003 EPA Policy links baseline requirements to LAs. It is important to understand how LAs are set to understand ~~how trades can help achieve water quality goals and how to set baseline requirements for credits to be traded, so that they will contribute to progress towards achieving the TMDL's goals.~~ LAs need to be connected to a regulatory trading baseline, but there are differences in between TMDLs for different pollutants. ~~There is~~ is not a clear, consistent approach for how to do this in current trading programs around the country. The options below discuss ways to make those connections.

**Commented [BC1]:** WHAT IF WE DELETED THIS WHOLE SECTION ON HUA? I DON'T THINK IT'S THAT IMPORTANT ANY MORE.

#### **1. Temperature**

##### **A. HUA & LAs to Nonpoint Sources in the HUA:**

For temperature, all three states include a HUA in their water quality standards.

- **Oregon Example:** In Oregon, "[i]nsignificant additions of heat are authorized in waters that exceed the applicable temperature criteria an individual point source in a temperature impaired

waterbody.”<sup>1</sup> This HUA is equal to 0.3°C. Oregon’s TMDLs tend to focus on cumulative impacts in the waterbody, and the HUA is allocated to meet water quality standards at a “point of maximum impact” (POMI) in the watershed. Oregon often divides the HUA into cumulative allocations for point sources (typically 0.2°C), nonpoint sources (typically 0.05°C), and reserve capacity for future growth (typically 0.05°C). In Oregon, typically all nonpoint sources above the POMI are eligible to trade, except for activities about dams, because an overall reduction in watershed warming is desired.

- **Idaho & Washington Examples:** In Idaho and Washington, there is also a 0.3°C HUA.<sup>2</sup> Instead of orienting the HUA around a point of maximum impact in the watershed, these two states use the HUA to ensure that individual point source discharges do not raise the receiving waterbody temperature by over 0.3°C at the end of the regulatory mixing zone in an NPDES permit.<sup>3</sup> Nonpoint sources do not explicitly receive a portion of the HUA. Without a POMI, it is possible that only nonpoint sources above the regulatory mixing zone of the particular point source would be eligible to trade.

#### B. LAs in TMDL

All three states include an analysis of “system potential vegetation” (a surrogate shade target) in the development of TMDLs and/or LAs because they have recognized that the loss of riparian vegetation is a large driver of waterway temperature issues. The three states all recognize that full shade is the target. There is variation in the extent to which it is each state assumed that target the full shade is assumed that the temperature target can be attained through riparian revegetation.

Some TMDLs have begun to explore width-to-depth ratios, base flow changes, and geomorphology as well.

- **Oregon Example:** Prior to developing load allocations, Oregon models the natural thermal potential of a waterbody, which assumes riparian ~~vegetation~~ vegetation system potential shade, natural base flows (without diversions), and sometimes a more natural stream geomorphology. In Oregon, this entailed application of natural thermal potential condition criteria.<sup>4</sup>
- **Idaho & Washington Example:** In Idaho and Washington, LAs are based on the achievement of system potential shade. If some ~~streams~~ streams a waterbody streams still ~~exceed~~ exceeds ~~exceed~~ the numeric criteria in the water quality standards after achieving system potential shade, that the exceedance of thermal load may be attributed to natural background.<sup>5</sup>

## 2. ~~Sediments~~ Dissolved Oxygen and Nutrients

### A. HUA

<sup>1</sup> OAR 340-041-0028(12)(b).

<sup>2</sup> IDAPA 58.01.02(401)(01)(c); WAC 173-201A-200(c).

<sup>3</sup> IDAPA 58.01.02(401)(01)(c); WAC 173-201A-200(c)(ii)(A).

<sup>4</sup> OAR 340-041-0028(8).

<sup>5</sup> IDAPA 58.01.02.250.02; WAC 173-201A-070(2).

- **Oregon Example:** Oregon has OAR 340-041-0004(3)(d) for Dissolved Oxygen. Up to a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as it has no adverse effects on threatened and endangered species. Oregon does not appear to have a HUA-type regulation for sediments, nutrients, or any parameters associated with those two pollutants (such as DO or pH).
- **Washington Example:** Washington includes HUA-type regulations for dissolved oxygen and pH.<sup>6</sup> For example, in river segments listed for dissolved oxygen, human actions considered cumulatively may not cause the DO to decrease more than 0.2 mg/L below natural conditions when DO levels are lower than aquatic life criteria for salmonids spawning, rearing and migration (8.0 mg/L). In lake segments, human actions considered cumulatively may not cause the DO to decrease more than 0.2 mg/L below natural conditions when DO levels are lower than aquatic life criteria for core summer salmonids habitat (9.5 mg/L). There are no nutrient- or sediment-specific HUA-type regulations.

**B. LAs to Nonpoint Sources in the HUA:**

Methods used to establish NPS load allocations ~~are not set consistently~~ consistently typically vary between the states. Often, it seems that baseline loads are calculated for particular industry sectors (e.g. agriculture), which are then multiplied by a percentage reduction target. This percentage reduction target seems to be based on best professional judgment. In other cases, this amount seems to be based on an expected reduction in human-caused pollution above natural background or baseline conditions. Another variable is whether LAs are established based on conservative estimates and assumptions, such as low flow water years. ~~Currently, the states do not appear to allocate any nutrient or sediment loads to specific nonpoint sources. landowners.~~

In several sediment TMDLs reviewed, for example, LAs were assigned using total suspended sediment (TSS) concentrations at fixed measurement points instream. Using the measured concentration and mass balance, some TMDLs calculated the reduction required at that point to achieve water quality standards. Implicitly, there is attenuation between measurement points and reduction requirements apply to the landscape upstream until the previous measurement point. Modeling on a watershed scale that accounts for attenuation would provide greater understanding of the full impact of upstream actions and allow for a larger water quality trading service area.

**I. Options and Examples**

<b>Option A</b> Provide no HUA for sediment and nutrient loading. Identify total load reduction goals, and point source reduction goals. Allocate remainder of load reduction goal to nonpoint sources.	<b>Option B</b> Assign LAs to particular tributaries based on mass balance equations. Reductions are assigned proportionately. No responsibility is assigned, but BMPs are recommended to meet target water quality standards.
<b>Option C</b>	<b>Option D</b>

<sup>6</sup> WAC 173-201-200(d), (g)

**Commented [Schary2]:** A goal for these options needs to be stated that directly relates to trading. As currently portrayed, it appears to be delving into policy for how to do TMDLs with no clearly stated purpose. I suggest something about these options are intended to provide a more clear understanding of where a credit can be created from something that is "additional" to what the Load Allocation requires. Then they should be compared on that basis. I'm finding it very confusing and vague with the way the discussion is currently framed.

**Commented [rln4]:** I am confused by the numbering system and this table makes me wonder whether there is supposed to be a different table for temperature.

**Commented [Schary3]:** Key words are missing - do you mean load reduction responsibility is not assigned to individual NPS sources or categories?



Model attenuation of sediment and nutrient loading throughout watershed. Provide HUA when current loading is above what the water quality standard requires to allow for current loading to continue and to provide reserve.	Assign load reductions to specific reaches. Target BMP implementation in areas with highest reduction requirements, and set LAs accordingly.
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### C. Surrogate measurements used to quantify TMDL-defined outcomes

In many cases, the need for a nutrient reduction is driven by another factor, for example, algal growth, pH, or dissolved oxygen. Shade is often used as a surrogate for temperature. Changes in these parameters are not surrogates, but potential progress indicators. An ideal surrogate relates to the ecosystem's characteristics (i.e. lake or river), has existing monitoring data, and ties load reductions of the surrogate to the particular beneficial uses that are being impaired.

- **Idaho Example:** Idaho often uses percent bank stability as a surrogate for sediment.
  - **Oregon Example:** Percent embeddedness in Wolman pebble count used as surrogate for depositional sediment in one Oregon TMDL reviewed.
- Washington Example:** Turbidity was used as a surrogate for suspended sediment in some of the Washington TMDLs reviewed.

### **2.3.2. Deriving, expressing, and applying regulatory baseline**

Across trading programs, there is variability in how baseline requirements are set. Many baseline requirements in current programs are not derived explicitly from TMDL Load Allocations. As a result, this section describes how baselines are expressed in terms used in trading, not necessarily in terms of Load Allocations. First, some programs require the adoption of a minimum set of BMPs (e.g. a farm plan or filter strips) prior to allowing a nonpoint project to generate credits, whereas other programs require nonpoint sources to generate a percentage of pollution reduction (e.g. 20% reduction in nutrient loading) prior to allowing that nonpoint source to sell credits). Second, very few trading programs define a specific load reduction target for an individual farm or riparian landowner (e.g. reduce 20 lbs TP/year). Third, trading programs vary in terms of whether individual farms must meet baselines prior to trading or whether whole groups of farmers in a watershed need to meet their load allocation prior to trading. Finally, trading programs vary as to how they identify a date after which implemented BMPs are eligible to generate credits.

#### 1. Expressing ~~regulatory~~ credit baseline

##### I. Options and examples

<p><b>Option A</b>  <i>Baseline requirements are expressed as a minimum set of BMPs that must be implemented at all project sites before credits can be generated.</i></p> <p><b>Pros and Cons</b>          Defining minimum BMPs ensures that the most efficient BMPs are implemented. This works well when required BMPs are defined in TMDLs and/or state policy and where BMP efficiency is consistent throughout the watershed and adoption is likely. This approach provides targeted recommendations for BMP implementation. One drawback is that this approach can reduce flexibility for farmers to design BMPs to reduce pollution and meet the needs of their operations. Another drawback is that BMP efficiency is highly dependent on local soil type, slope, crop rotation, etc.—blanket application of BMPs may result in an inefficient use of resources because high priority BMPs may not be implemented in favor of BMPs with the lowest costs. Virginia and Pennsylvania express baselines this way.<sup>7</sup></p>	<p><b>Option B</b>  <i>Baseline requirements are expressed as particular BMPs that must be implemented in priority areas identified by the TMDL as particularly high value areas for those particular actions.</i></p> <p><b>Pros and Cons</b>          This means that baseline requirements would apply at a project site if the site is located within a priority area identified by the TMDL for a particular BMP action, but not if the particular action is outside of these “baseline” areas.</p> <p>Defining minimum BMP targets for selected BMPs gives DMAs the ability to select the most efficient BMPs and target implementation at appropriate rates/locations within the watershed. Under this approach, however, there is an incentive for farmers to hold out on adopting BMPs until the baseline is met and they have the opportunity to generate credits (and revenue).</p>
<p><b>Option C</b>  <i>All project developers must reduce <u>X% from current conditions</u> or an absolute load (e.g. lbs) of pollution at a project site prior to generating credits.</i></p> <p><b>Pros and Cons</b>          This approach provides more flexibility to project developers in how they achieve pollution reductions. It also allows for easier connection of reductions back to LA targets in the TMDL. As a drawback, high priority BMPs may not be implemented in favor of BMPs with the lowest cost per pound of the target pollutant removed. Additionally, using an absolute load may introduce issues of equity because it may be far easier for “late adopters” to meet the required reduction than “early adopters” who have already taken actions. Maryland and Pennsylvania express baselines this way.<sup>8</sup></p>	

**II. Recommended Default:** ~~Options C—Baseline requirements should be expressed as a percentage reduction of pollution applied to individual credit generating projects.~~

**III. Reasons to deviate from the default:** Option B may be considered where a targeted analysis allows regulators to identify key places where BMPs should be implemented (where loading is highest). In watersheds where specific BMPs are needed and those BMPs are not likely to be implemented through a trading program, trading programs may require a minimum set of BMPs, as described in Option A. When there is both the need and possibility for groups of landowners within a

<sup>7</sup> Pa. Code ch. 96.8(d)(3)(A)-(B)

<sup>8</sup> Pa. Code ch. 96.8(d)(3)(C)

watershed to collectively meet their LA goals, trading programs may incentivize coordinated action by groups of landowners.

## 2. How do baseline requirements reflect LAs and other assumptions of the TMDLs?

Baseline requirements set the floor above which additional actions by nonpoint sources may be used by point sources to meet their pollution reduction targets, which are derived from their WLAs. There is limited documentation as to how trading programs have developed credit baseline requirements directly from the assumptions of the TMDL analysis.

### I. Options and examples

#### What assumptions are used to develop and support LAs?

<p><b>Option A</b> LAs are based on the assumption that nonpoint sources will maximize potential pollutant abatement by implementing temperature-reducing BMP actions in every location within the basin.</p> <p><b>Pros and Cons</b> This option assumes blanket/uniform adoption of BMPs across the landscape, and that implementation can occur everywhere (even where not physically possible). These assumptions (e.g. all streams at natural thermal potential for shade, morphology, and flow), may make it difficult for some actions to generate credits. Moreover, it is unclear whether these actions will occur within a reasonable timeframe, or ever. As a result, LAs may not be met through implementation plans alone. This approach may limit the space for trading.</p>	<p><b>Option B</b> LAs are based on an assessment of how much pollutant abatement BMP actions can actually achieve if they were implemented at only the physically and practically possible locations.</p> <p><b>Pros and Cons</b> Unlike Option A, this approach assumes that DMAs will implement BMPs only on physically available land (accounts for places where implementation is not possible – i.e. roads, sandy soils, human development, etc.). This would require agencies to identify a rough estimate of the net potential load reduction possible when implementing various actions throughout the watershed. This approach may limit the space for trading if the load allocation is equal to 100% achievement of all potential load reduction actions</p>
<p><b>Option C</b> LAs are based on an assessment of how much pollutant abatement BMP actions can actually achieve if implemented at projected adoption rates.</p> <p><b>Pros and Cons</b> This option pegs load allocations to on-the-ground realities related to BMP implementation, but will not be viable if anticipated reductions do not meet water quality standards.-</p>	

### II. Recommended Default: ?

### III. Reasons to deviate from the default?

#### How do credit baseline requirements lead to the attainment of LAs?

<p><b>Option A</b> Baseline requirements for credit generation are equal to nonpoint source LAs. All actions necessary to meet</p>	<p><b>Option B</b> Baseline requirements for credit generation are equal to a particular % of load amount of nonpoint source.</p>
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**Commented [Schary5]:** I don't understand the purpose of this part of the discussion. It sounds like you are really talking about what goes into the Reasonable Assurance section of the TMDL and what is really likely to happen. TMDLs must be written to show what is needed to attain water quality standards, so what you are hinting at here is that the TMDL doesn't match what is likely to happen – which is really about TMDL implementation, and not part of a discussion on TMDL development. What this has to do with a discussion on trading needs to be articulated very carefully. The fact that EPA's Trading Policy says the Load Allocation is the baseline is a key factor to consider in this discussion. Perhaps this sub-section should be deleted altogether.

I AGREE THIS HAS TO BE DELEGATE, BUT IT'S AN ESSENTIAL FINDING THAT CONTRADICTS EPA POLICY' INSISTENCE ON TYING BASELINE TO LAS.

~~baseline also serve as LAs.~~

#### Pros and Cons

Under this approach, all actions undertaken to meet baseline are counted toward LAs. Because the assumptions built into many TMDLs (e.g. all streams at natural thermal potential for shade, morphology, and flow) assume implementation of BMPs on all lands physically possible, may not be reasonable in some cases, it is unclear whether these actions will occur within a reasonable timeframe, if at all. As a result, LAs and baseline may not be met through DMA implementation plan with these plans alone. This approach may leave limited space for trading.

LAs.

#### Pros and Cons

Under this approach, actions/reductions taken to meet baseline requirements make up a portion/subset of the LA; this provides some flexibility to consider the how LAs are likely to be implemented and the role that trading is intended to play in meeting them.

#### Option C

*Baseline requirements for credit generation are equal to a particular % of load amount of nonpoint source LAs, but this percentage/load amount ~~attributable to~~ designated as the credit baseline increases over time.*

#### Pros and Cons

This approach provides a specific timeline for achieving a specific percentage of load reductions and provides incentives for early action from both point and nonpoint sources. It also sets some implementation deadlines that are not present in many current TMDLs. The challenge to a phased baseline is figuring out the time intervals and load reduction percentages to set. At the end of phased implementation, there may also need to be an adaptive management approach that evaluates how close implementation has come to achieving the WLAs and LAs. A phased baseline might be equivalent to a compliance schedule within an NPDES permit.

**II. Recommended default:** Option C - Establish a phased baseline strategy that uses fixed percentages of pollution reduction for nonpoint sources for specific periods of time. Under a phased baseline approach, there is an initial period where baseline is set according to the actions outlined in the implementation plans of DMAs (set as a percentage reduction or a target quantity of BMPs). Those percentages and time intervals should be based on past and likely BMP adoption rates, timelines within the TMDL, or other sources of information. After a period of time, baseline requirements increase. If intervals are set at 5-year periods, an evaluation of progress should be conducted at each 5-year interval to assess progress toward meeting pollution reduction targets and adjustments made as needed. Those adjustments could include changes to WLAs. There might be interim periods where baseline equals a % reduction.

**III. Reasons to deviate from the default:** In some cases, a TMDL analysis may explicitly call out or indicate a baseline reduction requirement. In other cases, agencies may choose to set a fixed baseline requirement that stays constant over time. In either case, there may be reasons not to use a phased approach, especially if available resources constrain the type of analysis needed to support a phased baseline.

### 3. Scale of applying baselines

#### I. Options and examples

Option A	Option B
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<p><i>Baseline requirements are set for individual landowners.</i></p> <p><b>Pros and Cons</b> This approach allows farmers to generate credits without relying on the actions of others.</p>	<p><i>Baseline requirements are set for groups of farms at the watershed scale used in the TMDL for a load allocation.</i></p> <p><b>Pros and Cons</b> This approach provides incentives for groups of farms or watersheds to come up with more comprehensive strategies for reducing pollution. That coordination need can also serve as a barrier to trading, <u>if everyone in the group needs to achieve baseline requirements before any one member of the group can sell credits.</u></p>
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**II. Recommended Default:** ~~Option A – baseline requirements should be applied to individual credit-producing projects.~~

**III. Reasons to deviate from the default:** What other situations should we consider?

4. Timing of meeting baselines

**I. Options and examples**

<p><b>Option A</b> <i>All baseline requirements must be met prior to implementing any BMP-generating credits.</i></p> <p><b>Pros and Cons</b> This can be a tough bar to achieve for many project developers because it increases the time to generating credits. On the other hand, it ensures that baselines are met.</p>	<p><b>Option B</b> <i>Baseline requirements can be met simultaneously with implementing credit-generating BMPs, but before any credits are sold.</i></p> <p><b>Pros and Cons</b> This approach allows project developers to take care of their baseline requirements simultaneously with the actions needed to generate credits. This can be implemented through a trading ratio when baseline is expressed as a % reduction, or as part of verification to ensure inspection of minimum BMPs. This approach also provides stable funding for <u>baseline-helping implement baseline-the Load Allocation.</u></p>
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**II. Recommended Default:** Option B - baseline requirements can be met simultaneously with credit-producing activities, but must be confirmed as being met prior to selling any credits.

**III. Reasons to deviate from the default:** What other situations should we consider?

5. Setting a base year for creditable actions

Each trading programs needs to define a year, after which BMPs can be eligible to generate credits. In some trading programs, the base year is tied to a TMDL, in many others the base year is tied to completion of a trading program agreement.

**I. Options and examples**

<p><b>Option A</b> Credits can be generated for any “new” BMPs implemented after the approval of a TMDL or a renewed NPDES permit where there is no TMDL.</p> <p><b>Pros and Cons</b> This may be one of the most straightforward ways to approach setting a base year. However, it may provide some disincentive for farmers with good non-structural BMPs to continue those BMPs leading up to a new TMDL of renewed NPDES permit with trading included.</p>	<p><b>Option B</b> Credits can be generated for any “new” BMPs implemented after the approval of a new or revised NPDES permit containing trading.</p> <p><b>Pros and Cons</b> This is also a relatively straightforward approach. Especially where the TMDL is a few years old or more, allowing credits to be generated for all the practices already implemented presents questions of additionality. This option may provide some disincentive for farmers with good non-structural BMPs to continue those BMPs leading up to a <u>buyer’s</u> new <u>NPDES</u> permit, but it also ensures work that would have (and did) occur anyway is not used to offset new impacts.</p>
<p><b>Option C</b> Any non-structural BMP that is implemented on an annual cycle is creditable, even if BMP has been implemented in years prior to signing a TMDL or a renewed NPDES permit.</p> <p><b>Pros and Cons</b> <del>Maryland uses this approach to incentivize ongoing use of non-structural BMPs.</del> This approach provides credits for actions that occurred prior to a TMDL. Some have expressed concern that this may not produce additional benefits; others have argued that this is a way to prevent landowners from stopping beneficial practices to become eligible for credit sales. Maryland uses this approach to incentivize ongoing use of non-structural BMPs.</p>	<p><b>Option D</b> For non-structural BMPs, there is a “look-back” period prior to signing a TMDL or NPDES permit where BMPs are eligible to generate credits (e.g. 3 years). <u>That period could also be defined by the year of the data used to define WLAs and LAs in the TMDL.</u></p> <p><b>Pros and Cons</b> <del>The Ohio Basin program uses this approach to strike a balance between Options A and B.</del> This approach rewards good actors. However, a “look-back” period provides credits for actions that occurred prior to a TMDL, which in some cases may not be additional. The Ohio Basin program uses this approach to strike a balance between options A and B.</p>

**II. Recommended Default:** Option A - All trading programs will define a date after which implemented BMPs are eligible to generate credits. This date should be tied to the approval of a TMDL or a renewed NPDES permit for trades in watersheds without a TMDL.

**III. Reasons to deviate from the default:** What other situations should we consider?

6. Use of public cost share to meet credit baselines

#### I. Options and examples

<b>Option A</b> <i>Public cost share dollars can be used to meet baseline requirements, but only when expressed as minimum BMPs.</i>  <b>Pros and Cons</b> No states that we know of differentiate use of cost share between baselines expressed as minimum BMPs or % reductions in pollution.	<b>Option B</b> <i>Public cost share dollars can be used to meet baseline requirements.</i>  <b>Pros and Cons</b> Maryland, Virginia, and Pennsylvania explicitly allow cost share to help meet baselines.
<b>Option C</b> <i>Public cost share dollars <u>cannot</u> be used to meet baseline requirements.</i>  <b>Pros and Cons</b> No states that we know of disallow cost share to meet baseline requirements.	

**II. Recommended Default:** Option B - Public cost share dollars can be used by project developers to help meet baseline requirements (e.g. if a nonpoint source needs to reduce its pollution by 30% to meet baseline, then EQIP funds can cost share for up to 30% of a project's costs).

**III. Reasons to deviate from the default:** We don't anticipate any reasons to deviate from this. Are we missing anything?

### 2.3.3. Business as usual (at the project site)

Requirements for additionality aim to ensure that credits are not produced from activities that would not have occurred anyway. In addition to going above and beyond what is required by law, regulation, or policy, a nonpoint source entity ~~may need to~~ must install practices that go beyond business as usual within the industry. The 2003 EPA policy does not require going above and beyond business as usual. For example, carbon markets have developed specific requirements for business as usual because much of the credit-generating activity is voluntary and not subject to explicit regulatory requirements. In the water quality trading, the question of whether an action is part of business as usual may arise if the credit generating project will provide a significant financial or other gain to a farmer's operation. In this scenario, the project developer will need to demonstrate why credits are needed to finance that work. Defining business as usual can be challenging, especially as new sets of BMPs begin to be implemented. Each trading program will likely need to define its own criteria and how it chooses to verify those criteria are being met.

### I. Options and examples

<b>Option A</b> <i>Additionality beyond business as usual is determined based on <u>statements provided by the project developer</u>.</i>  <b>Pros and Cons</b> WP has followed this approach, asking project developers to make a narrative case for why the project is above and beyond business as usual for	<b>Option B</b> <i>Additionality beyond business as usual is determined <u>based on criteria that can be confirmed by an agency, permittee, or third party verifier</u>.</i>  <b>Pros and Cons</b> This approach necessitates specific criteria and confirmation of information provided by the project developer. It does allow for more standardized
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them. This approach still provides a standard for business as usual, while giving the benefit of the doubt to project developers to define what that is	determinations based on a particular industry, but may introduce unnecessary costs or review when much of additionality is covered by regulatory requirements.
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**II. Recommended default:** ~~Option A In water quality trading, regulatory requirements cover many of the concerns over additionality. Defining additionality beyond business as usual has proven a significant transaction cost and hurdle in carbon markets. It can be very difficult to define and verify.~~

**III. Reasons to deviate from the default:** In some cases, Option B may provide more certainty that credits are truly additional, and this may be worth the transaction cost in some cases.

#### 2.3.4. Reasonable assurances

When a WLA is derived ~~set at a level that presumes the nonpoint LA will be met from a nonpoint source LA~~, EPA requires a TMDL to describe the reasonable assurances that will allow for achievement of the LAs. Reasonable assurances in TMDLs are often described in terms unique to a local watershed, including descriptions of federal, state, and local regulatory authorities and available funding sources. In some cases, demonstration of reasonable assurances is not applicable because there are no point sources in the watershed, or because ~~WLAs are not set at a level that depends on the nonpoint source reductions~~. ~~LAs are not directly linked to WLAs.~~ If LAs and WLAs are not directly correlated, it is still important to tie LAs to nonpoint source implementation plans so as to ensure that the actions undertaken by designated management agencies (DMAs) are achieved on a particular timeline.

#### I. Options and Examples

<b>Option A</b> <i>Identify DMAs and types of actions those DMAs will undertake.</i>	<b>Option B</b> <i>Identify DMAs, identify types of actions those DMAs will undertake, and identify implementation deadlines/milestones.</i>
<b>Option C</b> <i>Identify DMAs identify types of actions those DMAs will undertake, identify implementation deadline, identify priority areas for undertaking those particular actions, and run various scenarios for achieving those milestones.</i>	

**II. Recommended default:** Unclear. Outstanding questions to address include:

- How important are reasonable assurances if WLAs and LAs are not correlated?
- How can implementation plans identify timelines and milestones for achieving LA goals?
- Do historical BMP adoption rates, BMP efficiency rates, or quality standards in particular watersheds provide an appropriate benchmark for setting implementation plan objectives/timelines?
- Should projected DMA funding play a role in setting implementation plan objectives/timelines?
- What sort of follow-up is necessary to track implementation performance?



- What are the necessary mechanisms for rectifying slower-than-expected implementation of nonpoint LA actions?

**III. Reasons to deviate from the default:** What other situations should we consider?